

**IN THE UNITED STATES DISTRICT COURT
OF THE EASTERN DISTRICT OF TEXAS
TEXARKANA DIVISION**

NATIONAL OILWELL VARCO, L.P., §
Plaintiff §

CIVIL ACTION NO. 5:09cv85

v. §

AUTO-DRIL, INC., §
Defendant §

MEMORANDUM OPINION AND ORDER

Before the Court are Plaintiff's Claim Construction Brief (Docket Entry No. 97), Defendant's Responsive Claim Construction Brief (Docket Entry No. 114), and Plaintiff's Claim Construction Reply Brief (Docket Entry No. 135). Also before the Court are the parties' Claim Construction Prehearing Statements (Docket Entry Nos. 141, 142) and the First Amended Claim Construction Chart (Docket Entry No. 149). A claim construction hearing, in accordance with *Markman v. Westview Instruments*, 52 F.3d 967 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996), was held on June 30, 2011. After hearing the arguments of counsel and reviewing the relevant pleadings, presentation materials, other papers, and case law, the Court finds the disputed terms of the patent-in-suit should be construed as set forth herein.

I.

Background

On June 12, 2009, Plaintiff National Oilwell Varco, L.P. ("Plaintiff") initiated a patent infringement lawsuit against Auto-Dril, Inc. ("Defendant"), alleging infringement of United States Patent No. 5,474,142 ("the '142 Patent"). The '142 Patent is entitled *Automatic Drilling System* and was filed on April 19, 1993 by inventor Bobbie J. Bowden ("Bowden"). The '142 Patent issued on December 12, 1995 and expires on April 19, 2013 (20 years after it was filed in accordance with 35

U.S.C. § 154).

Plaintiff contends that Defendant's "Navigator" and "Navigator Pro" products infringe upon claims 1, 11, and 14 of the '142 Patent directly (both literally and under the doctrine of equivalents in accordance with 35 U.S.C. §271(a)) and indirectly (through contributing to or inducing the infringement by a third party in accordance with 35 U.S.C. § 271 (b) and (c)). The '142 Patent has been litigated several times and has been reexamined twice. On May 14, 2010, this case was referred to the undersigned for all further proceedings and entry of final judgment in accordance with 28 U.S.C. § 636(c) and the consent of the parties.

II.

Legal Principles

A determination of patent infringement involves two steps. First, the patent claims are construed, and, second, the claims are compared to the allegedly infringing device. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1455 (Fed. Cir.1998) (*en banc*).

The claims of a patent define the invention to which the patentee is entitled the right to exclude." *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). In claim construction, courts examine the patent's intrinsic evidence to define the patented invention's scope. *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc'ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

The legal principles of claim construction were reexamined by the Federal Circuit Court of Appeals in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). Reversing a judgment of non-infringement, an *en banc* panel specifically identified the question before it as: "the extent to which [the court] should resort to and rely on a patent's specification in seeking to ascertain the proper scope of its claims." *Id.* at 1312. Addressing this question, the Federal Circuit specifically

focused on the confusion that had amassed from its scattered decisions on the weight afforded dictionaries and related extrinsic evidence as compared to the intrinsic record. Ultimately, the court found that the specification, “informed, as needed, by the prosecution history,” is the “best source for understanding a technical term.” *Id.* at 1315 (quoting *Multiform Dessicants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478 (Fed. Cir. 1998)). However, the court was mindful of its decision and quick to point out that *Phillips* is not the swan song of extrinsic evidence, stating:

[W]e recognized that there is no magic formula or catechism for conducting claim construction. Nor is the court barred from considering any particular sources or required to analyze sources in any specific sequence, as long as those sources are not used to contradict claim meaning that is unambiguous in light of the intrinsic evidence.

Phillips, 415 F.3d at 1324. Consequently, this Court’s reading of *Phillips* is that the Federal Circuit has returned to the state of the law prior to its decision in *Texas Digital Sys. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), allotting far greater deference to the intrinsic record than to extrinsic evidence. “[E]xtrinsic evidence cannot be used to vary the meaning of the claims as understood based on a reading of the intrinsic record.” *Phillips*, 415 F.3d at 1319.

Additionally, the Federal Circuit in *Phillips* expressly reaffirmed the principles of claim construction as set forth in *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (Fed. Cir. 1995) (*en banc*), *aff’d*, 517 U.S. 370 (1996), *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996), and *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111 (Fed. Cir. 2004). Thus, the claim-construction principles taught by these cases remain in force. Claim construction is a legal question for the court. *Markman*, 52 F.3d at 979. The claims of a patent define that which “the patentee is entitled the right to exclude.” *Innova*, 381 F.3d at 1115. And the claims are “generally given their ordinary and customary meaning” as the term would mean “to a person of ordinary skill in the art in question at the time of the invention, *i.e.*, as of the effective

filing date of the patent application.” *Vitronics*, 90 F.3d at 1582. However, the Federal Circuit stressed the importance of recognizing that the person of ordinary skill in the art “is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Phillips*, 415 F.3d at 1313.

Advancing the emphasis on the intrinsic evidence, the *Phillips* decision explains how each source, the claims, the specification as a whole, and the prosecution history, should be used by courts in determining how a skilled artisan would understand the disputed claim term. *See, generally, id.* at 1314-17. The court noted that the claims themselves can provide substantial guidance, particularly through claim differentiation. Using an example taken from the claim language at issue in *Phillips*, the Federal Circuit observed that “the claim in this case refers to ‘steel baffles,’ which strongly implies that the term ‘baffles’ does not inherently mean objects made of steel.” *Id.* at 1314. Thus, the “context in which a term is used in the asserted claim can often illuminate the meaning of the same term in other claims.” *Id.* Likewise, other claims of the asserted patent can be enlightening, for example, “the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim.” *Id.* at 1315 (*citing Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004)).

Still, the claims “must be read in view of the specification, of which they are part.” *Markman*, 52 F.3d at 978. In *Phillips*, the Federal Circuit reiterated the importance of the specification, noting that “the specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’ ” 415 F.3d at 1315 (*quoting Vitronics*, 90 F.3d at 1582). To emphasize this position, the *Phillips* court cites extensive case law, as well as “the statutory directive that the inventor provide a ‘full’ and ‘exact’ description of the claimed invention.” *Id.* at 1316 (*citing Merck & Co. v. Teva Pharms. USA*,

Inc., 347 F.3d 1367, 1371 (Fed. Cir. 2003)); *see also* 35 U.S.C. § 112, ¶ 1. Consistent with these principles, the court reaffirmed that an inventor’s own lexicography and any express disavowal of claim scope is dispositive. *Id.* at 1316. Concluding this point, the court noted the consistency with this approach and the issuance of a patent from the Patent and Trademark Office and found that “[i]t is therefore entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claims.” *Id.* at 1317.

Additionally, the *Phillips* decision provides a terse explanation of the prosecution history’s utility in construing claim terms. The court simply reaffirmed that “the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.* (citing *Vitronics*, 90 F.3d at 1582-83). It is a significant source for evidencing how the patent office and the inventor understood the invention. *Id.*

Finally, the Federal Circuit curtailed the role of extrinsic evidence in construing claims. In pointing out the less reliable nature of extrinsic evidence, the court reasoned that such evidence 1) is by definition not part of the patent, 2) does not necessarily reflect the views or understanding of a person of ordinary skill in the relevant art, 3) is often produced specifically for litigation, 4) is far reaching to the extent that it may encompass several views, and 5) may distort the true meaning intended by the inventor. *See id.* at 1318. Consequently, the Federal Circuit expressly disclaimed the approach taken in *Texas Digital*. While noting the *Texas Digital* court’s concern with regard to importing limitations from the written description – “one of the cardinal sins of patent law,” the Federal Circuit held that “the methodology it adopted placed too much reliance on extrinsic sources such as dictionaries, treatises, and encyclopedias and too little on intrinsic sources, in particular the

specification and prosecution history.” *Id.* at 1320. Thus, the court renewed its emphasis on the specification’s role in claim construction.

Many other principles of claim construction, though not addressed in *Phillips*, remain significant in guiding this Court’s charge in claim construction. The Court is mindful that there is a “heavy presumption” in favor of construing claim language as it would be plainly understood by one of ordinary skill in the art. *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 (Fed. Cir. 1999); *cf. Altiris, Inc., v. Symantec Corp.*, 318 F.3d 1364, 1372 (Fed. Cir. 2003) (“[S]imply because a phrase as a whole lacks a common meaning does not compel a court to abandon its quest for a common meaning and disregard the established meaning of the individual words.”). The same terms in related patents are presumed to carry the same meaning. *See Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1334 (Fed. Cir. 2003) (“We presume, unless otherwise compelled, that the same claim term in the same patent or related patents carries the same construed meaning.”) “Consistent use” of a claim term throughout the specification and prosecution history provides “context” that may be highly probative of meaning and may counsel against “[b]roadening of the ordinary meaning of a term in the absence of support in the intrinsic record indicating that such a broad meaning was intended” *Nystrom v. TREX Co.*, 424 F.3d 1136, 1143-46 (Fed. Cir. 2005).

Claim construction is not meant to change the scope of the claims but only to clarify their meaning. *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000) (“In claim construction the words of the claims are construed independent of the accused product, in light of the specification, the prosecution history, and the prior art. . . . The construction of claims is simply a way of elaborating the normally terse claim language[] in order to understand and explain, but not to change, the scope of the claims.”) (citations and internal quotations omitted). Regarding claim

scope, the transitional term “comprising,” when used in claims, is inclusive or open-ended and “does not exclude additional, unrecited elements or method steps.” *CollegeNet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 1235 (Fed. Cir. 2005) (citations omitted). Claim constructions that read out a preferred embodiment are rarely, if ever, correct. *Vitronics*, 90 F.3d at 1583-84.

While claim construction is a matter for the Court, it need not provide a new definition or rewrite a term, particularly when the Court finds the term’s plain and ordinary meaning is sufficient. The Federal Circuit addressed this issue in *O2 Micro International Ltd v. Beyond Innovation Technology Co.*, 521 F.3d 1351 (Fed. Cir. 2008). In *O2 Micro*, the Federal Circuit considered the term “only if” in independent claim 1 which requires “a DC/AC converter circuit comprising: a feedback control loop circuit . . . adapted to generate a second pulse signal . . . only if said feedback signal is above a predetermined threshold.” *Id.* at 1356. The defendant asserted that its controllers did not satisfy the limitation of claim one because there were circumstances where the feedback signal controlled power to the load “even though the feedback signal falls below the predetermined threshold.” *Id.* Two defendants had asked the district court to construe the term “only if” to mean “exclusively or solely in the event that,” another defendant argued the term to mean “never except when,” and the plaintiff argued that no construction was needed. *Id.* at 1357. The district court had noted that there was a dispute as to whether “only if” would have an exception but chose to rule that the term needed no construction. *Id.*

The Federal Circuit noted that “[a]t trial, the ‘only if’ limitation was a key issue disputed by the parties.” *Id.* at 1358. The Federal Circuit stated that the “purpose of claim construction is to ‘determin[e] the meaning and scope of the patent claims asserted to be infringed.’” *Id.* at 1360 (citing *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc)). The Federal Circuit clarified that “[w]hen the parties raise an actual dispute regarding the proper scope

of these claims, the court, not the jury, must resolve that dispute.” *Id.* (citing *Markman*, 52 F.3d at 979). The primary dispute, as acknowledged by the district court, was whether the “only if” limitation applied during the “the steady state operation of the switching circuit” or at all times without exception. *Id.* at 1360. The Federal Circuit noted that the parties had agreed to the “meaning” of the term but not to the claim’s “scope.” *Id.* at 1361. The Federal Circuit stated that “[a] determination that a claim term ‘needs no construction’ or has the ‘plain and ordinary meaning’ may be inadequate when a term has more than one ‘ordinary’ meaning or when reliance on a term’s ‘ordinary’ meaning does not resolve the parties’ dispute.” *Id.* The Federal Circuit found that the district court’s failure to construe “only if” effectively allowed the jury to construe the term. *Id.* at 1362. The Federal Circuit also recognized, however, that “district courts are not (and should not be) required to construe *every* limitation present in a patent’s asserted claims.” *Id.* (emphasis in original) (citing *Biotec Biologische Naturverpackungen GmbH & Co. KG v. Biocorp, Inc.*, 249 F.3d 1341, 1349 (Fed. Cir. 2001); *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997)).

As explained by one district court, there is a heavy presumption that a claim term carries its ordinary meaning. *Bd. of Trustees of the Leland Stanford Junior University v. Roche Molecular Sys.*, 2007 U.S. Dist. LEXIS 87219, at *19 (N.D. Cal. Nov. 27, 2007) (citing *Phillips*, 415 F.3d at 1314). The court further explained that some terms, such as “therapeutically effective,” are commonplace terms that a juror could understand without further direction from the court. *Id.* The court found that the terms “do not need to be construed because they are neither unfamiliar to the jury, confusing to the jury, nor affected by the specification or prosecution history.” *Id.* at *19-*20 (citing *Ethicon*, 103 F.3d at 1568 (“Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered

by the claims, for use in the determination of infringement. It is not an obligatory exercise in redundancy.”)). However, the Federal Circuit held that “[w]hen the parties present a fundamental dispute regarding the scope of a claim term, it is the court’s duty to resolve it.” *O2 Micro*, 521 F.3d at 1362.

The Court concludes that when two parties offer different constructions, or if one side argues for ordinary meaning, then the Court must first determine whether it has a duty to resolve the meaning and the scope. While it is a district court’s duty is to construe the claims, part of this duty is to determine the extent which to construction is even necessary. With regard to meaning, where additional language may be unduly limiting, confusing, or redundant, it is in a court’s power to determine that no construction is necessary. A court may decline to adopt constructions that violate claim construction doctrine, such as improperly importing limitations, and may still construe terms to have their ordinary meaning. *See id.* at 1360.

Guided by these principles of claim construction, this Court directs its attention to the ‘142 Patent and the disputed claim terms.

III.

The Patent-in-Suit: U.S. Patent No. 5,474,142

A. Overview of the technology

The Court uses the following overview from Plaintiff’s opening claim construction brief. The ‘142 Patent relates to an automatic drilling system that regulates the release, *i.e.*, controls the rate of release, of the drill string in response to any one, any combination of, or all of the following parameters: (1) bit weight, (2) drilling fluid pressure, (3) drill string torque, and (4) drill string RPM, to achieve an optimal rate of bit penetration. ‘142 Patent, Abstract. These drilling parameters are measured with sensors that output signals representing the individual properties being

measured. ‘142 Patent, Col. 1, ll. 51-67. One or more of these signals are then used by the automatic driller to direct the operation of a drawworks of a drilling rig to control the rate of release of the drill string associated with the drilling rig. Figure 1 of the ‘142 Patent illustrates the general arrangement of a drilling rig (10) that is controlled by this automatic driller (33).

The drilling rig is equipped with several sensors. A pressure sensor (34) measures the drilling fluid pressure. ‘142 Patent, Col. 3, l. 55 – Col. 4, l. 56. In Figure 1, the pressure sensor is located on the standpipe, which is the length of pipe that stretches from the mud pump (25) to the flexible hose that attaches to the drill string (21). Other sensors include a bit weight sensor (35) attached to the drilling cable (28) near the cable anchor (27), a torque sensor (36) connected to the rotary table (24) of the drilling rig, and an RPM sensor (37) connected to the rotary table. ‘142 Patent, Col. 6, ll. 12-65. Each of these sensors is connected to the automatic driller in the manner described below with reference to Figures 1 and 2 of the ‘142 Patent.

Figures 1 and 2 also show that the automatic driller is connected to a brake handle (208) of a drawworks (22). The drawworks is a system used to lower the drill string (assembly of drill pipes) into the bore hole. In a typical drawworks (as shown and/or illustrated in the ‘142 Patent), the drill string is at least partially suspended by cables from the derrick of the drilling rig. The cables are spooled by a cable drum within the drawworks, which may be powered by a motor. The motor is used to wind the cables on the drum and thereby lift the drill string. The drill string is lowered by the force of gravity and controlled by a brake on the drawworks’ drum which controls the rotational speed of the drum, thereby controlling the rate at which the drill string is lowered into the bore hole. As the drill bit digs through the earth, the drum must release cable to permit the drill string to be lowered into the bore hole. “Rate of release” refers to the rate or speed at which the drill string is lowered into the bore hole. The brake handle controls the amount of braking force applied to the

drum (26) of the drawworks, and thereby regulates the rate of release of the cables suspending the drill string. An automatic driller utilizes the signals sent from sensors to the automatic driller to maintain the rate of release of the drill string near an optimum value. *See* ‘142 Patent, Col. 4, ll. 15-31.

The automatic driller of the preferred embodiment (Figure 2 of the Bowden Patent) includes a series of pressure regulators: drilling weight pressure regulator (201); bit pressure regulator (203). Each of these pressure regulators receives a signal from its corresponding sensor. The automatic driller also includes an air motor (204) that drives a differential gear (205). The differential gear (205) manipulates a cable reel (206) that raises and lowers the brake handle of the draw works. The brake handle adjusts the braking force applied to the drum, thereby controlling the rate of release of the drill string. ‘142 Patent, Col. 7, ll. 16-25.

Each of the pressure regulators includes a corresponding valve (236-239) that acts as a relay that provide signal(s) to an air motor. The air motor controls the rate of release of the drill string based on the signal received from the valves. A compressed air source provides the compressed air that controls the motor. A flow regulator (212) limits the maximum pressure delivered to the valves, thereby limiting the maximum rate of release of the drill string. ‘142 Patent, Col. 7, ll. 26-48.

Each of the valves regulates the flow of air to the air motor based on the signal that each valve receives from its corresponding regulator, which is in turn based on the signal that each regulator receives from its corresponding sensor. According to Plaintiff, after calibration of a regulator to maintain a desired value (a set-point value) of the associated drilling parameter (*see, e.g.,* ‘142 Patent, Col. 8, l. 52 – Col. 10, l. 3), a regulator will control its associated valve so as to modify the rate of release of the drill string to maintain the set-point value of the associated parameter. *See, e.g.,* ‘142 Patent, Col. 8, ll. 16-31.

B. Previous litigation of the ‘142 Patent

Regarding the history of litigation of the ‘142 Patent, the Court uses the following overview from Defendant’s responsive claim construction brief.

1. The Colorado action against Pason

In 2003, Wildcat Services, L.P. filed a patent infringement action against Pason Systems USA Corp. (“Pason”) in the United States District Court for the District of Colorado alleging infringement of the ‘142 Patent (the “Colorado action”). During the pendency of the Colorado action, Plaintiff Wildcat Services, L.P. was acquired by Varco, L.P. which subsequently merged with National Oilwell to form National Oilwell Varco, L.P. The district court in the Colorado action issued a January 10, 2008 Ruling on [Some] Claim Construction Issues. (“*Pason* Court’s Ruling on Claim Construction Issues.”). The district court’s claim construction in the Colorado action is also found in the jury instructions. (“*Pason* Jury Charge”). A final judgment has not been entered in the Colorado action, and the case is set for a bench trial on inequitable conduct November 28, 2011.

2. *Varco v. Pason* preliminary injunction appeal to the Federal Circuit

In the Colorado action, the parties agreed to proceed on Varco’s motion for preliminary injunction on claim 14 only. At the preliminary injunction hearing, the parties addressed claim construction issues relating to the “selecting” and “relaying” steps of claim 14. On November 15, 2004, the district court in the Colorado action denied Varco’s Motion for Preliminary Injunction. Varco appealed the district court’s denial of its application for preliminary injunction to the Court of Appeals for the Federal Circuit. *Varco, L.P. v. Pason Systems USA Corp.*, 436 F.3d 1368 (Fed. Cir. 2006)(“*Varco*”). The Federal Circuit concluded the Colorado district court’s interpretation of both the selecting step and the relaying step was unduly restrictive. *Id.* at 1376. Because the district court’s claim construction led to its denial of the preliminary injunction motion, the Federal Circuit

vacated the denial and remanded the case to the district court for further proceedings, including the proper interpretation of claim 14. *Id.*

IV.

Claim Construction

A. Framework of a feedback control system

In this case, Plaintiff and Defendant agree that the invention of the ‘142 Patent is a feedback control system deployed on a conventional drilling rig. Thus, the Court’s claim construction is simplified by understanding the disputed claim terms in the framework of a feedback control system. A feedback control system maintains a prescribed relationship between the output of a system and the reference input and does so on the basis of the difference, called the “error.” A feedback control system senses the chosen input, calculates the error, amplifies the sensed input, and outputs a control signal.

In the ‘142 Patent, the control signal can be any increase or any decrease in one or more of four drilling parameters (bit weight, drilling fluid pressure, revolutions per minute [rpm], or torque) to increase or decrease the rate of release of the drill string. ‘142 Patent, Col. 1, ll 58-63. The key structural components of the drilling system are sensors, regulators, relays and a drill string controller. The regulators produce a signal representing any change in the selected drilling parameter. The regulators attach to the relays which are connected “in series so that all the regulators may be utilized concurrently.”

The relays attach to a drill string controller and relay a drill string control signal from the regulators to control the drilling operation. The components comprising the brake of the drilling rig are included in the drill string controller. For example, if the change in drilling fluid pressure is a decrease then the drill string control signal operates the drill string controller to increase the rate of

release of the drill string. If the change in drilling fluid pressure is an increase then the drill string control signal operates the drill string controller to decrease the rate of release of the drill string. The drilling system produces a signal by the regulator communicated through the relay to the drill string controller.

Claims 1 and 11 control the rate of release of the drill string using only one parameter, drilling fluid pressure. Claim 14 controls the release of the drill string using two parameters, drilling fluid pressure and bit weight, separately or in combination. The rate of release is in response to “changes” in at least one parameter.

B. Agreed Terms

The parties have agreed on the construction of the following claim terms. The parties agree “rate of release” should be construed as “rate of lowering.” The parties agree “regulates the release” should be construed as “to increase or decrease the rate of lowering of the drill string.” The parties agree “producing a first signal in response to changes” and “producing a second signal in response to changes” need no construction. The parties also agree that no construction is necessary for the term “drill bit.”

C. Disputed Terms

1. **“Results,” “to control,” “controlling,” “operates,” and “controlling said drill string controller to increase the rate of release of said drill string when said signal represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string when said signal represents an increase in drilling fluid pressure.”**

a. Parties’ Positions

“Results” and **“operates”** are present in claim 1 of the ‘142 Patent.

Claim 1: “... a decrease in drilling fluid pressure **results** in said relay supplying a drill string control signal that **operates** said drill string controller to effect an increase in drilling fluid pressure **results** in said relay supplying a drill string control signal that **operates** said drill string controller”

“Controlling” and “controlling said drill string controller to increase the rate of release of said drill string when said signal represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string when said signal represents an increase in drilling fluid pressure” are present in claim 11.

Claim 11: **“...controlling said drill sting controller to increase the rate of release of said drill string when said signal represents a decrease in drilling fluid pressure** and to decrease the rate of release of said drill string when said signal represents an increase in drilling fluid pressure”

“To control” is present in claim 14.

Claim 14: “...selecting any one of said first signal, said second signal, and both said first and said second signals **to control** the release of said drill string; and relaying said selected signal or signals to a drill string controller which regulates the release said drill string in response to said selected signal or signals”

Plaintiff	Defendant
No construction necessary. Alternatively: To proceed or arise as a consequence, effect, or conclusion.	The drill string controller increases the rate of release with any decrease in drilling fluid pressure and decreases the rate of release with any increase in drilling fluid pressure.

b. Court’s Construction

Plaintiff asserts these terms need no construction and should be given their plain and ordinary meanings. According to Plaintiff, Defendant proposes the same paragraph-long construction for five entirely different claim terms and phrases present in three individual claims. Defendant argues “operates,” “results,” and “controlling” mean that the drill string controller increases the rate of release with *any* decrease in drilling fluid pressure and decreases the rate of release with *any* increase in drilling fluid pressure. According to Defendant, the control provided by the automatic driller is accomplished by the operation of the drill string controller that results in either an increase in the rate of release or a decrease in the rate of release.

As support for its proposed construction, Defendant relies on the following. Claim 1 states that “a” decrease in drilling fluid pressure results in a signal and “an” increase in drilling fluid pressure results in a signal. In the Summary of the Invention, the inventor describes the regulators as receiving their respective signals to measure changes in those signals and produce an output signal representative of “any changes.” ‘142 Patent, Col. 2, ll. 4-6. Each of the four regulators is dedicated to a drilling parameter and outputs a signal representing “those changes” in the drilling parameter. ‘142 Patent, Col. 2, ll. 6-14. The specification of the ‘142 Patent further provides as follows:

The drill string controller attaches to the relays to receive a drill string control signal from the regulator or regulators controlling the drilling operation. Illustratively, when the relay connected to the drilling fluid pressure regulator *receives a decrease* in drilling fluid pressure signal, it *supplies a drill string control signal* that operates the drill string controller to effect an increase in the rate of release of the drill string. Conversely, *an increase* in drilling fluid pressure *results in the relay supplying a drill string control signal* that operates the drill string controller to effect a decrease in the rate of release of the drill string.

‘142 Patent, Col. 2, ll. 25-35 (emphasis added). The specification further provides that it is “an object of the present invention to provide an automatic driller capable of automatically controlling the release [of] the drill string of a drilling rig in response to changes in any one of, any combination of, or all of drilling fluid pressure, bit weight, drill string torque, and drill string RPM.” ‘142 Patent, Col. 2, ll. 61-66.

Defendant asserts the object of the invention is to provide a drill string control signal that operates the drill string controller to increase/decrease the rate of release of the drill string, and changes (*i.e.* increases and decreases) in the drilling fluid pressure (or other drilling parameter) operate the drill string controller, which causes a corresponding decrease/increase in the rate of release of the drill string. Plaintiff acknowledges the claim language provides for “an increase” and “a decrease.” However, Plaintiff asserts the specification gives only an illustrative example where

it would result in an increase or a decrease.

As urged by Plaintiff, the invention is a control system designed to maintain one or more user defined set-points. Generally, if the drilling fluid pressure rises above the user defined set-point, the system is designed to respond by decreasing the rate of release to affect a corresponding decrease in the drilling fluid pressure until the drilling fluid pressure returns to the set-point value. Conversely, when the drilling fluid pressure drops below the user defined set-point, the system is designed to respond by increasing the rate of release to affect a corresponding increase in the drilling fluid pressure until the drilling fluid pressure returns to the set-point value.

The Summary of the Invention of the '142 Patent provides that the present invention be capable of automatically controlling the release in response to changes, not that the drill string controller increase the rate of release with any and every decrease in drilling fluid pressure and decrease the rate of release with any and every increase in drilling fluid pressure:

It is, therefore, an object of the present invention to provide an automatic driller **capable** of automatically controlling the release [of] the drill string of a drilling rig in response to changes in any one of, any combination of, or all of drilling fluid pressure, bit weight, drill string torque, and drill string RPM.

'142 Patent, Col. 2, ll. 61-66.

The Court further agrees with Plaintiff that the description of the preferred embodiment gives several examples that describe when there is a decrease in drilling fluid pressure or an increase in drilling fluid pressure that does not always affect the rate of release as required by Defendant's construction. For example, in the preferred embodiment, if any one or more of the other drilling parameters are used in combination with drilling fluid pressure, *e.g.*, weight-on-bit, torque or RPM, and the system is controlling to a parameter other than drilling fluid pressure, then any change in drilling fluid pressure will have no effect on the rate of release of the drill string. As noted by

Plaintiff, where drilling fluid pressure is set as a secondary control parameter and the drilling fluid pressure is below the set-point, then any changes in drilling fluid pressure below the drilling fluid pressure set-point will have no effect on the rate of release of the drill string.

Additionally, the preferred embodiment of the '142 Patent has various error detection and safety devices which will slow or stop the rate of release of the drill in response to detected errors, drilling malfunctions, or dangerous drilling conditions. '142 Patent, Col. 10, l. 62 –Col. 11, l. 8. Importantly, the '142 Patent's specification specifically states that “not every decrease in drilling fluid pressure should result in the release of the drill string.” *Id.* In the preferred embodiment of the '142 Patent, a system is described whereby “[i]n the event of a large decrease in drilling fluid pressure” or when “drilling fluid pressure drops below an operator set minimum,” safety shut-down knob 217 causes the automatic drilling system to decrease the rate of release and/or stop the lowering of the drill string until the drilling fluid pressure returns to within the operator set limits. *See* '142 Patent, Col. 11, ll. 9-25.

Given the preferred embodiment provides examples that describe when there is a decrease in drilling fluid pressure or an increase in drilling fluid pressure that does not always affect the rate of release as required by Defendant's proposed construction, the Court finds Defendant's proposed construction is too narrow and excludes the operation of the preferred embodiment. The invention simply does not require that every increase cause a decrease and every decrease cause an increase.

As argued by Plaintiff, these five terms are commonly understood and are used consistently without definition in the '142 Patent. The Court is of the opinion these terms should be given their plain and ordinary meaning.

Thus, the Court finds no construction is necessary for the terms “results,” “to control,” “controlling,” “operates,” and “controlling said drill string controller to increase the rate of release

of said drill string when said signal represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string when said signal represents an increase in drilling fluid pressure.”

2. “With direct effect at the drill bit associated with the drill string”

a. Parties’ Positions

The parties propose the following constructions for this phrase which occurs in claims 1 and 11 of the ‘142 Patent.

Claim 1: “said drill string controller to effect an increase in the rate of release of said drill string **with direct effect at the drill bit associated with the drill string**”

Claim 11: “said drill string controller to increase the rate of release of said drill string **with direct effect at the drill bit associated with the drill string** and to decrease the rate of release of said drill string **with direct effect at the drill bit associated with the drill string**”

Plaintiff	Defendant
No construction necessary.	The vertical movement of the drill string at the drill bit actuated by pressure of the pumped fluid. In addition, this term requires that the effective weight of the entire drill string must be applied to the drill bit.

b. Court’s Construction

This phrase was added during the second reexamination of the ‘142 Patent to clarify the inventions of claims 1 and 11 from U.S. Patent No. 1,891,329 to LeCompte, et. al. (“LeCompte”). *See* 2nd Reexamination File Wrapper. According to Defendant, the amendment was made specifically to avoid the LeCompte reference as shown by the USPTO Examiner’s remarks, and this term must be construed in light of LeCompte:

Claim 1 has been amended to define over the LeCompte et al. reference (US 1,891,329) taken alone. Specifically the claim has been amended to recite that the drill string controller responds to a decrease in drilling fluid pressure by affecting an increase in the rate of release of the drill string *with direct effect at the drill bit*, and the drill string controller responds to an increase in drilling fluid pressure by affecting a decrease in the rate of release of the drill string *with direct effect at the drill bit*. As argued by the patent owner, this amendment defines over LeCompte et al.

Statement of Reasons for Patentability and/or Confirmation at 2 (emphasis in original).

The Examiner characterized LeCompte as follows:

LeCompte et al. controls the rate of release of the upper drill string portion, but the drill bit is isolated from the upper drill string portion by a telescopic section positioned between the upper drill string portion and the lower drill string portion. As a result, the control of the rate of release of the upper drill string portion in LeCompte et al. does not take place with direct effect at the drill bit, as required by the claim.

Id. Plaintiff identified the difference between the amended claims and LeCompte as:

It is submitted that LeCompte teaches away from this element [with direct effect at the drill bit associated with the drill string] of Claim 1 and Claim 11 by expressly preventing full extension or full compression of the telescoping joint in order to ensure that the predetermined weight provided to the drill bit by the lower drill stem section is constantly applied to the drill bit, and that no additional weight is applied owing to the release of the upper drill stem section. ('... at no time can the upper drill stem section come into contact and rest upon the lower drill stem section to add all its weight to the drilling bit ... [t]he bit is intended to be entirely safe from the weight of the upper drill stem at all times . . .') See LeCompte, Page 6, ll. 31-34; 43-46. Thus, a release of the upper drill stem is prevented from having a direct effect at the drill bit associated with the drill string.

Response to Final Office Action at pg. 15.

According to Defendant, the telescoping section of LeCompte is provided between the upper and lower drill stem segments for the purpose of preventing application of any additional weight to the drill bit. Defendant asserts claims 1 and 11 of the '142 Patent provide that the drill string controller affects either an increase or a decrease in the rate of release of the drill string in response to changes in drilling fluid pressure. Regarding the first part of its proposed construction, "the vertical movement.

. . ,” Defendant relies on the specification, which provides that the drawworks adjust the drill string “vertically” to retain the drill bit on the bottom of the borehole. ‘142 Patent, Col. 4, ll. 16-17.

Plaintiff characterizes LeCompte as functioning with a telescoping joint which separates an upper drill string (stem) section and a lower drill string (stem) section. According to Plaintiff, this telescoping joint acts similar to a shock absorber or spring and prevents the upper drill string from ever contacting the lower drill string section. Plaintiff agrees with Defendant that the purpose of the telescoping joint is to prevent the upper drill string from ever contacting the lower drill string which would add additional weight to the bit. However, Plaintiff further asserts the release of the lower drill string and the drill bit attached thereto is independent of the release of the upper drill string, and LeCompte only controls the release of the upper drill string above the telescoping joint with no effect upon the lower drill string and drill bit positioned below the telescoping joint. According to Plaintiff, the release of the upper drill string section of LeCompte is prevented from ever having an effect upon the release of the lower drill string section and drill bit affixed thereto positioned below the telescoping joint. *See LeCompte*, Ex. 25, p. 6, ll. 31-34; 43-48:

at no time can the upper drill stem section come into contact and rest upon the lower drill stem section to add all its weight to the drilling bit ... [t]he bit is intended to be entirely safe from the weight of the upper drill stem at all times so that a predetermined weight can always be applied to the bit as recommended by the manufacturers of the bit for the various earth formations. The ‘142 Patent controls the rate of release of the entire drill string including a drill bit connected to the drill string.

Ex Parte Reexamination Confirmation at pg. 3.

As urged by Plaintiff, the amendment to claims 1 and 11 clarified what was already inherent in the specification. As described in the description of the preferred embodiment:

Drawworks 22 must adjust drill string 21 vertically along derrick 20 in order to retain drill bit 23 ‘on bottom’ (*i.e.* on the bottom of borehole 86) and maintain the progression of borehole 86 through formation 87. As long as drill string 21 maintains sufficient and constant pressure on drill bit 23, drill bit 23 will gouge borehole 86 from

formation 87 at an optimal rate of penetration chosen based upon composition of formation 87. Rates of penetration vary from as little as four feet per hour to as much as one hundred and eighty feet per hour. If, however, drawworks 22 did not adjust drill string 21, drill bit 23 would rise ‘off bottom’ (*i.e.* off the bottom of the borehole 86) and the progression of borehole 86 through formation 87 would cease. Accordingly, brake 32 must be manipulated to permit drum 26 to release cable 28 and adjust drill string 21, thereby providing the constant pressure on drill bit 23 required to maintain optimal rate of penetration.

‘142 Patent, Col. 4, ll. 16 – 32.

The automatic driller of the ‘142 Patent functions to maintain this described optimal rate of penetration. The automatic driller does this by connecting “to brake handle 208 via cable 207 to regulate the release of cable 28 from drum 26.” ‘142 Patent, Col. 4, ll. 33 – 36. Thus, it is the cable of the drawworks that allows movement of the drill string with direct effect of the drill bit associated with the drill string “in order to retain drill bit 23 ‘on bottom’ (*i.e.*, on the bottom of borehole 86).” Plaintiff asserts the use of telescoping joints which prevent the release of the upper drill string from affecting the lower drill string would thwart the underlying purpose sought by the invention of the ‘142 Patent.

The Court is of the opinion the addition of this element to claims 1 and 11 should be interpreted to exclude a system which has two or more independently moveable drill string segments separated by a device which prohibits one of the drill string segments to affect the other drill string segment. This is clear from the language of the ‘142 Patent. The Court is not convinced the claim language requires the movement always be “vertical.” The Court does not find proper or particularly helpful the first part of Defendant’s proposed construction that the “vertical movement of the drill string at the drill bit actuated by pressure of the pumped fluid.”

Finally, the Court considers whether Plaintiff, by amending claims 1 and 11 to overcome LeCompte, has required that the weight of the entire drill string must be effective at the drill bit as

suggested by the second part of Defendant's proposed construction. As described in the preferred embodiment:

Automatic driller 33 senses when drill bit 23 is 'off bottom' and manipulates brake 32 to release cable 28 from 26 Automatic driller 33 determines when drill bit 23 is 'off bottom' by measuring drilling fluid pressure, bit weight, drill string torque, and drill string revolutions per minute (RPM).

'142 Patent, Col. 4, ll. 36-46. According to Plaintiff, when the drill bit is "off bottom," the weight of the drill string is not applied to the drill bit. Instead, at that moment in time, the drill string and the drill bit are suspended by the drilling rig's hoisting system. In such an instance, as noted by Plaintiff, Defendant's proposed construction would exclude the preferred embodiment of the patent.

Additionally, the specification describes that only a portion of the weight of the entire drill string is applied to the bit. The Description of the Related Art states:

The lowering of the drill string *places additional weight* of the drill string on top of the drill bit in order to increase bit weight back to its desired value. . . . [O]nce the weight indicator measures a bit weight that falls outside the desired bit weight entered into the automatic driller by the drilling rig operator, the automatic driller manipulates the brake handle to release the cable drum brake which lowers the drill string cable, thereby *placing more weight* of the drill string upon the drill bit.

'142 Patent, Col. 1, ll. 18-33 (emphasis added). As long as the drilling fluid remains at that optimum pressure, drill bit 23 will reside "on bottom" with sufficient bit weight to drill borehole 86 through formation 87. '142 Patent, Col. 8, ll. 18-20.

As urged by Plaintiff, the specification describes the placement of "additional weight" or "more weight" of the drill string upon the drill bit and/or "sufficient bit weight," not placement of the entire weight of the drill string upon the drill bit. Nowhere in the '142 Patent is there a suggestion or requirement that the entire weight of the drill string should be applied to the drill bit. A person of ordinary skill in the art would not view this phrase as requiring that the entire weight of the drill string be applied to the drill bit. As persuasively argued by Plaintiff, a person of ordinary skill in the art

would know that drill bits and/or mud motors could be severely damaged if the entire weight of the drill string was placed upon the down-hole components.

The Court disagrees with Defendant’s proposed construction and agrees with Plaintiff that the phrase should be given its plain and ordinary meaning. In light of the foregoing, the Court finds no construction is necessary for “with direct effect at the drill bit associated with the drill string.”

3. “Measuring changes” and “changes”

a. Parties’ Positions

These terms are found in claims 1, 11, and 14 of the ‘142 Patent.

Claim 1: “a drilling fluid pressure regulator coupled to said drilling fluid pressure sensor, said drilling fluid pressure regulator **measuring changes** in drilling fluid pressure and outputting a signal representing those **changes**”

Claim 11: “producing a signal in response to **changes** in drilling fluid pressure, said signal representing the **changes** in drilling fluid pressure.”

Claim 14: “producing a first signal in response to **changes** in drilling fluid pressure, said first signal representing the **changes** in drilling fluid pressure”

Plaintiff	Defendant
Measurement of changes over time which will also be compared to a set reference point.	Any increase or any decrease.

b. Court’s Construction

Defendant asserts “changes” means *any* increase or *any* decrease. Claims 1, 11, and 14 each use the term “changes” in the context of “changes in drilling fluid pressure.” Claim 14 also recites “changes in bit weight.” Although claim 1 recites a “drilling fluid pressure regulator” that is used for “measuring” the “changes,” none of the claims specify or limit how the “changes” are measured. Therefore, according to Defendant, no further limitation of the terms is required as urged by Plaintiff.

In support of its proposed construction, Plaintiff relies on the *Pason* court's claim construction ruling, asserting their proposed construction clarifies the meaning of "changes" to include, "measurement of changes over time which will also be compared to a set reference point." Plaintiff asserts this clarification will aid a jury in understanding the context of the use of "changes" in the '142 Patent. The Colorado district court in *Pason* adopted NOV's proposed construction of "change" in claims 1, 11, and 14:

Pason contends 'measuring change' of the Claim 1 and response to changes in drilling fluid pressure in Claim 11 and changes in drilling fluid pressure and changes in bit weight in Claim 14 must mean either changes in time or a change from a set-point but cannot be both. The argument is not persuasive. The goal of maintaining an optimum parameter constant necessarily requires measurement of changes over time which will also be compared to a set reference point.

Pason Court's Claim Construction Ruling at pg. 4.

Relying on *Pason*, Plaintiff asserts the '142 Patent teaches that the measured "changes" represent both: (1) the difference between a current measured value and the set-point value; and (2) the difference between current measured value and a previous measured value. According to Plaintiff, this is so because the drilling fluid pressure regulator of the preferred embodiment always outputs a control signal, not just when the system detects a change.

Plaintiff further argues its construction draws support from the specification of the patent. Figure 3 of the '142 Patent illustrates the regulator (200) and the valve (operating as a relay) of the preferred embodiment. The operation of the preferred embodiment discloses a hydraulic signal corresponding to the drilling fluid pressure communicated to the Bourdon tube (210) from a pressure sensor (34). *See, e.g.*, sensors at Figs. 4-6. The Bourdon tube extends or contracts according to the hydraulic pressure communicated to it. In response, the flapper's (213) position changes with the degree of deflection of the Bourdon tube. Therefore, the position of the flapper (213) which controls

the amount of air deflected or output from the nozzle (216) outputs a signal that varies with a corresponding change in the measured drilling fluid pressure. For example, according to Plaintiff, if the drilling fluid pressure in the standpipe was 2500 pounds per square inch (“psi”) and it increased to 2600 psi, the output signal from the drilling fluid pressure regulator would also change to represent the change in pressure. Any measured change in drilling fluid pressure necessarily causes a new or different signal to be output from the nozzle. Similarly, when the drilling fluid pressure is at the set-point or desired pressure and is not changing for a given interval of time, the output signal will remain the same, representing a change of “0” to maintain the current position of the brake handle. According to Plaintiff, in that case, the currently measured pressure and the desired or set-point pressure are the same; any subsequent change in the measured pressure represents a change from both the set-point pressure and the previously measured pressure, and the change in pressure causes the nozzle (216) of the regulator to output a signal representing the change.

Finally, Plaintiff asserts the ‘142 Patent also describes changes as the increase and decrease in the measured drilling fluid and or bit weight as follows:

[E]ven under optimal drilling conditions drill bit 23 will rise ‘off bottom,’ thus requiring drilling fluid pressure regulator 200 to readjust the release of cable 28 from drum 26. Any time drill bit 23 rises even slightly ‘off bottom,’ drilling fluid pressure within drill string 21 decreases. Drilling fluid pressure sensor 34 measures that decrease and supplies Bourdon tube 210 with a hydraulic signal representing that decrease [*i.e.*, change].

‘142 Patent, Col. 10, ll. 6-12. According to Plaintiff, the patent’s description supports an interpretation of claim language requiring a signal representing the “changes” in drilling fluid pressure or weight-on-bit as encompassing signals representing any change, whether as a change from a set-point or desired pressure/weight-on-bit, or a change from a previously measured pressure/weight-on-bit, or both.

The Court does not find the first part of Plaintiff's proposed construction, "measurement of changes. . .," to be helpful or clarifying as it merely restates the phrase to be construed. Instead, the Court agrees with Defendant that the term "changes" means "an increase or a decrease" in the drilling fluid pressure or the bit weight. However, the Court declines to use the descriptive modifier "any" as proposed by Defendant.

The Court also disagrees with Defendant that the language of the claims does not require the increases or decreases (changes) in drilling fluid pressure and bit weight to occur "over time" or to be "compared to a set reference point" as urged by Defendant. A safety shut-down system is described in the '142 Patent. Col. 11, ll. 9-24 (drilling fluid pressure); Col. 17, ll. 11-28 (drill string torque); Col. 20, ll. 23-39 (drill string RPM). An "operator set minimum" is described for the operation of the safety shut-down system. And, as found by the *Pason* court, the "goal of maintaining an optimum parameter constant necessarily requires measurement of changes over time which will also be compared to a set reference point." *Pason* Court's Claim Construction Ruling at pg. 4. The Court agrees with Plaintiff that the '142 Patent teaches that the measured "changes" represent both the difference between a current measured value and the set-point value and the difference between current measured value and a previously measured value.

The Court will adopt a modified construction from the *Pason* court's claim construction. The Court construes "measuring changes" and "changes" to mean "an increase or a decrease from a set reference point or from a previously measured value."

4. **“Producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure.”**

a. Parties’ Positions

The parties propose the following constructions for this phrase which is found only in claim

11.

Claim 11: **“producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure; relaying said signal to a drill string controller; and controlling said drill string controller...”**

Plaintiff	Defendant
No construction necessary. Alternatively: e.g. to create, generate, produce a signal in reaction to something said signal representing changes in drilling fluid pressure.	A signal generated by, and representing, only increases and decreases in drilling fluid pressure.

b. Court’s Construction

Plaintiff asserts this phrase needs no construction and should be given its plain and ordinary meaning. Plaintiff argues the inventor did not use a special meaning to define the words contained in this claim language, and a person of ordinary skill in the art at the time of the invention would understand its meaning. Regarding its alternative proposed construction, Plaintiff asserts the phrase “in response to,” as in “producing a signal in response to,” is described in the specification as responsive to a “change” in drilling fluid pressure. According to Plaintiff, Defendant’s proposed construction of this phrase impermissibly limits the invention to producing a signal that represents *only* changes in drilling fluid pressure.

The ‘142 Patent specification describes how a signal is produced in response to the drilling fluid pressure as follows:

The sensors output signals representing drilling fluid pressure, bit weight, drill string torque, and drill string RPM to a drilling fluid pressure regulator, a bit weight regulator, a drill string torque regulator, and a drill string RPM regulator, respectively. The regulators receive their respective signals to measure changes in those signals *and produce an output signal representative of any changes*. Specifically, the drilling fluid pressure regulator measures *changes in drilling fluid pressure* and outputs a signal representing those changes.

‘142 Patent, Col. 1, l. 66 - Col. 2, l. 8. The language of claim 11 is consistent with this description.

Plaintiff asserts the preferred embodiment can produce a drill string control signal even when there is no change in drilling fluid pressure. For example, Plaintiff describes a situation where the system of the preferred embodiment is operating at the operator chosen set-point for drilling fluid pressure and the drilling fluid pressure is maintaining this set-point value. In such a situation, the drilling fluid pressure regulator’s flapper 213 is maintained a constant distance from the nozzle 216 to deflect a relative, constant amount of compressed air to valve 236 to drive down diaphragm 240 to compress springs 226 and 227 and open the valve a specific amount to deliver compressed air from the air supply to flow from cavity 228 into cavity 229 and out from valve 236; this compressed air is the drill string control signal that operates air motor 204 of the controller. As explained by Plaintiff, even when there is no change in drilling fluid pressure, there is a drill string control signal generated to the relay, and this drill string control signal cannot be directly proportionate to the change in drilling fluid pressure as no change in drilling fluid pressure has occurred.

The Court is not convinced, as urged by Defendant, that this phrase should be construed to mean a signal generated by, and representing, *only* increases and decreases in drilling fluid pressure. However, Plaintiff’s alternative proposed construction merely restates what is clear from the language of the phrase itself. With the Court’s previous construction of “changes” in mind (“an increase or a decrease from a set reference point or from a previously measured value”), this phrase shall be given its ordinary meaning. Accordingly, the Court finds no construction necessary for “producing a signal

in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure.”

5. “Selecting”

a. Parties’ Positions

The parties propose the following constructions for this term which is present in claim 14 of the ‘142 Patent. The main dispute is whether this term includes “only” as urged by Defendant.

Claim 14: “...**selecting** any one of said first signal, said second signal, and both said first and said second signal to control the release of said drill string...”

Plaintiff	Defendant
No construction necessary. Alternatively: e.g., automatic selecting, i.e., choosing.	Choosing of only the first signal to control the release of the drill string or only the second signal to control the release of the drill string or both the first and the second signal to control the release of the drill string.

b. Court’s Construction

According to Defendant, the term “selecting” means the choosing of only the first signal to control the release of the drill string or only the second signal to control the release of the drill string or both the first signal and the second signal to control the release the drill string. Defendant asserts the Summary of the Invention provides the operator of the automatic driller “selects” which one or more of the regulators (bit weight, drilling fluid pressure, rpm, or torque) control the drilling operation. ‘142 Patent, Col. 2, ll. 22-24. According to Defendant, the step of “selecting” occurs when the human operator decides which drilling parameter or parameters will control the drilling operation; each of the four relays is attached to a relay selector, an on/off switch, which permits the operator of the driller to select which regulator(s) will control the drilling operation. *Id.*

Plaintiff first asserts this term needs no construction. Alternatively, Plaintiff relies on the Federal Circuit’s opinion in *Varco* to support its position that the selecting step is performed automatically. While it is true the term “automatic” does not appear anywhere in claim 14 as pointed out by Defendant, the Federal Circuit was unambiguous in its discussion of “selecting” in claim 14 that: (1) it is not limited to manual operation selectors and/or manual calibration of regulators as construed by the Colorado court; (2) it does not always require intervention by one of the parameters; (3) with an initial setup procedure in place, the drilling system then automatically selects between the primary and secondary controls during operation. *Varco*, 436 F.3d at 1373-74. The Court relies on these statements in the Federal Circuit’s opinion in declining to adopt Defendant’s proposed construction.

The Colorado court relied on the portions of the specification referenced by Defendant and its construction was reversed and remanded by the Federal Circuit.

The preamble recites that the method steps are to be performed automatically by the drilling rig. This language suggests that the selecting step is not limited to manual operation of valve selectors and/or manual calibration of regulators as construed by the district court. . . . Hence, the language of claim 14 (particularly the preamble) does not support the district court’s construction of this step.

* * *

[T]he Examiner did not understand the drilling system’s method for resolving conflicts between the ‘primary’ and ‘secondary’ controls. . . . In response, the applicant explained to the Examiner that the operator, as part of the initial setup procedure can adjust the level for override of the primary control, thus ensuring that only undesirable conditions will trigger intervention. With this initial adjustment in place [initial setup or calibration], the drilling system then automatically selects between the primary and secondary controls during operation. Thus, the prosecution history confirms that selecting in claim 14 does not encompass the initial setup or calibrate of the drilling system, but rather the conflict resolution process between primary and secondary controls during operation.

* * *

‘selecting’ in claim 14 must refer to the conflict resolution process that occurs between controlling parameters.

Varco, 436 F.3d at 1373-74 (emphasis added). Thus, the Federal Circuit interpreted the “selecting” step to mean the automatic selection accomplished by the automatic driller that resolves the conflict resolution process that occurs between controlling parameters. The Colorado district court in the *Pason* litigation further interpreted the “selecting” term to mean:

Automatically choosing the first signal, or the second signal, or both the first and second signals to control the release of the drill string.

Pason Jury Charge at pg. 10.

In light of the foregoing, the Court construes the term “selecting” to mean “automatically choosing.”

6. “Relay” or “relaying” or “relaying said selected signal or signals”

a. Parties’ Positions

The parties propose the following constructions for these terms which are present in claims 11 and 14 of the ‘142 Patent.

Claim 1: “A **relay** coupled to said drilling fluid pressure regulator, said relay responsive to the output signal of said drilling fluid pressure regulator to supply a drill string control signal at an output thereof.”

Claim 11: “producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in drilling fluid pressure; **relaying** said signal to a drill string controller.”

Claim 14: “producing a first signal in response to changes in drilling fluid pressure, said first signal representing the changes in drilling fluid pressure; producing a second signal in response to changes in bit weight, said second signal representing the changes in bit weight; selecting any one of said first signal, said second signal, and both said first and said second signals to control the release of said drill string; and **relaying said selected signal or signals to** a drill string controller which regulates the release said drill string in response to said selected signal or signals.”

Plaintiff	Defendant
Relay = A device that communicates an electronic, mechanical or pneumatic signal.	The act of receiving an input signal from the drilling fluid pressure regulator only and allowing the output signal to flow.
Relaying = Conveying or passing along said selected signal.	

b. Court's Construction

Plaintiff asserts these terms are commonly used words that can be given their ordinary and customary meaning. *Phillips*, 415 F.3d at 1321. Plaintiff also provides alternative proposed constructions for “relay” and “relaying.” The ‘142 Patent describes a preferred embodiment that contains valves which operate as relays by communicating a variable signal in response to changes in a measured parameter to the actuating device. ‘142 Patent, Col. 8, ll. 42-44; Col. 8, ll. 52-57. According to Plaintiff, the relays valves (236 through 239) disclosed in the ‘142 Patent operate as a variable control flow device, *e.g.*, a choke. For example, according to Plaintiff, an adjustable choke is a common flow device that can “vary the volume of fluid, such as a flowing gas and/or liquid, to pass through it as a result of changes to a drilling parameter. Plaintiff asserts the relay valves (236 through 239) are not limited to simple on and off switches but include widely variable openings, orifices, and/or flow-through diameters to control the amount of compressed air or hydraulic fluid (*i.e.*, the signal) which is passed on by the valves.

Defendant seeks to limit the relay to receiving “an input signal *only* from the drilling fluid pressure regulator and allowing the output signal to flow.” The Court agrees with Plaintiff that Defendant seeks to read the structural limitation of a “regulator” into method claim 14. Nowhere in method claims 11 and 14 are structures mentioned, and the language of the claims does not require a drilling fluid pressure regulator from which an input signal is received. *DSW, Inc. v. Shoe Pavilion*,

Inc., 537 F.3d 1342, 1347 (Fed. Cir. 2008) (holding cannot import limitations from apparatus and system claims into method claims when method claim not directed to structure or assembly of apparatus or system claim). The Court will not import a limitation into the claims that requires the device to receive an input signal directly from or “only” from the drilling fluid pressure regulator.

A similar position was taken by Pason in the Colorado case. The preferred embodiment of the patent-in-suit described in the specification involves the use of “relaying” one or more signals in a hydraulic or pneumatic system. The Colorado court in *Pason* initially construed “relaying” to mean “transmitting a signal by means of pneumatically operated valves.” The Federal Circuit held the “relaying” step is not limited to pneumatically operated valves. *Varco*, 436 F.3d at 1375. The Federal Circuit stated as follows:

As outlined above, nothing in the claim language requires or even suggests the use of pneumatically operated valves in performing the relaying step. Rather, the only discussion of pneumatically operated valves in the intrinsic record comes from the specification: ‘In the *preferred embodiment*, valves 236 – 239 are pneumatic valves *that operate as relays* to supply compressed air to air motor 204.

Id. On remand, the Colorado court further interpreted “relaying said selected signal or signals to a drill string controller which regulates the release [of] said drill string in response to said selected signal or signals” term to mean:

Passing along the selected signal or signals to a drill string controller which regulates the rate of release of the drill string in response to the selected signal or signals.

Pason Jury Charge at pg. 10.

Although the Court finds Defendant’s proposed construction attempts to impermissibly read structure limitations into method claims 11 and 14, the Court also declines to adopt Plaintiff’s proposed constructions for these terms. Plaintiff’s proposed construction expands the scope of claim 1 to include the type of signal - electrical, mechanical, hydraulic, or pneumatic. A particular type of

signal is not claimed in claim 11. Consequently, the Court does not find construction necessary for the term “relay.”

“Relaying” is one step in the multi-step method of claims 11 and 14. Plaintiff’s proposed construction does not capture the essence of “relaying” nor would it help the jury. The essence of relaying is the “passing on” as construed by the *Pason* court. Therefore, the Court adopts the *Pason* court’s construction of “relaying” here to mean “passing along the selected signal or signals to a drill string controller which regulates the rate of release of the drill string in response to the selected signal or signals.”

7. “Drilling fluid pressure regulator”

a. Parties’ Positions

The parties propose the following constructions for “drilling fluid pressure regulator,” which is present in claim 1 of the ‘142 Patent.

Claim 1: “**a drilling fluid pressure regulator** coupled to said drilling fluid pressure sensor, said **drilling fluid pressure regulator** measuring changes in drilling fluid pressure and outputting a signal representing those changes; a relay coupled to said **drilling fluid pressure regulator**, said relay responsive to the output signal of said **drilling fluid pressure regulator**. ... ”

Plaintiff	Defendant
No construction necessary. Alternatively: A drilling fluid (i.e, mud) pressure regulator, e.g., a device that is capable of detecting and responding to electrical, mechanical, hydraulic, or pneumatic signal(s).	A device that is calibrated and receives an input signal only from the drilling fluid pressure sensor and measures changes in drilling fluid pressure over time which will be the difference between a predetermined value and a current measured value and outputs a signal corresponding to drilling fluid pressure changes to a relay.

b. Court's Construction

Plaintiff contends the phrase “drilling fluid pressure regulator” consists of commonly used words that can be given their ordinary and customary meaning. Plaintiff also proposes an alternative construction, asserting it comports with how a person of ordinary skill in the art would understand the term without impermissibly importing limitations into the claim as Defendant's proposed construction does.

In support of its proposed construction, Defendant asserts the relay in claim 1 must be coupled to the drilling fluid pressure sensor; it must measure changes in the drilling fluid pressure; and it must output the drill string control signal that operates the drill string controller. According to Defendant, the '142 Patent also requires that the regulator must be calibrated for the drilling system to work automatically:

However, before drilling fluid regulator 200 will automatically regulate drilling fluid pressure, nozzle 216 and flapper 213 must be calibrated to supply a driller operator selected amount of compressed air to valve 236. . . .

'142 Patent, Col. 8, ll. 58-61.

The language of claim 1 does not define “drilling fluid pressure regulator.” The specification of the '142 Patent identifies the required components of the invention as sensors, regulators, relays, and a drill string controller. '142 Patent, Col. 1, ll. 58 - Col. 2, ll. 35. The '142 Patent specification describes two embodiments of an automatic driller, which are generally shown in Figures 2 and 14. Figure 3 provides additional details of the embodiment shown in Figure 2. The Summary of the Invention states the operation of the regulators of the preferred embodiment as follows:

The sensors output signals representing drilling fluid pressure, bit weight, drill string torque, and drill string RPM to a drilling fluid pressure regulator, a bit weight regulator, a drill string torque regulator, and a drill string RPM regulator, respectively. The regulators receive their respective signals to measure changes in those signals and produce an output signal representative of any changes. Specifically, the drilling fluid

pressure regulator measures changes in drilling fluid pressure and outputs a signal representing those changes.

‘142 Patent, Col. 1, ll. 66 - Col. 2, ll. 8.

Defendant’s proposed construction seeks to narrow “drilling fluid pressure regulator” to receive an input signal “only from the drilling fluid pressure sensor.” The specification of the ‘142 Patent does not provide the restrictive “only” language contained in Defendant’s proposed construction. Such an exclusion is specifically discussed as one example in the specification:

However, **if for example**, only drilling fluid pressure regulator 200 is to control the drilling operation, valve selector 232 remains switched on while valve selectors 233 – 235 are switched off.

Col. 7, ll. 54 – 57 (emphasis added).

Defendant’s proposed construction also reads limitations from the preferred embodiment into the claims. In discussing a similar argument to include “*only* subject matter described ...” in the description of a preferred embodiment, the Federal Circuit Court of Appeals has held that “the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction.” *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 905 (Fed. Cir. 2004); *See also CollegeNet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 1231 (Fed. Cir. 2005)(“In examining the specification for proper context, however, this court will not at any time import limitations from the specification into the claims.”)

Additionally, Defendant’s proposed construction imports the exclusionary word “either” into what the “drilling fluid pressure regulator” measures (“and measures changes in drilling fluid pressure which will be either an increase or a decrease. . .”). According to Plaintiff, the regulator(s) output a signal representing a change in the associated drilling parameter to another device (a valve operating

as a relay) which then supplies a control signal to a drill string controller in response to the output signal from the regulator (controls the rate of release of the drill string). ‘142 Patent, Col. 2, ll. 15 – 20. In the description of the preferred embodiment, the “regulator” element of claim 1 of the ‘142 Patent is described as performing specific functions, namely measuring changes in drilling fluid pressure and outputting a signal representing those changes. ‘142 Patent, Col. 4, ll. 43 – 45. Plaintiff takes issue with Defendant’s proposed construction, asserting there are situations where the “drilling fluid pressure regulator senses no changes and the regulator is maintained at a steady state when the drilling fluid pressure is constant, i.e. neither increasing nor decreasing.” Plaintiff’s reply at pg. 11. See ‘142 Patent, Col. 9, l. 64-Col. 10, l. 35 (“the amount of compressed air valve 236 delivers to air motor 204 stabilizes to a constant amount. As a result, air motor 204 maintains brake engaged against drum at a constant force. . . .”)(emphasis added). The Court finds persuasive Plaintiff’s assertion, based on the claim language, that there may be situations where the drilling fluid pressure regulator senses no changes, and the regulator is maintained at a steady state when the drilling fluid pressure is constant.

In addition, the claim language does not support Defendant’s argument regarding calibration. As pointed out by Plaintiff, the calibration process was viewed by the Federal Circuit as part of the initial setup process. In *Varco*, the Federal Circuit held the district court erred by reading the initial setup or calibration step into the “selecting” claim. *Varco*, 436 F.3d at 1373.

In *Pason*, the Colorado district court addressed the term “drilling fluid pressure regulator” and held as follows:

. . . Varco construes ‘drilling fluid pressure regulator’ to describe a device that is capable of detecting and responding to electrical, mechanical, hydraulic or pneumatic signals. Drilling fluid, often referred to as ‘drilling mud’ and ‘pressure’ are terms with established meaning in the drilling industry. The term drilling fluid pressure regulator must be understood in the context of the use of measurement of changes in drilling

fluid pressure and producing a signal representing changes in drilling fluid pressure. It is therefore coupled with the drilling fluid pressure sensor.

Pason Court’s Ruling on Claim Construction at pg. 3. Here, the Court agrees with Plaintiff that the phrase “drilling fluid pressure regulator” consists of commonly used words that can be given their plain and ordinary meaning. The Court finds no construction is necessary for “drilling fluid pressure regulator.”

8. “Coupled to”

a. Parties’ Positions

This term is present in claim 1 of the ‘142 Patent.

Claim 1: “a drilling fluid pressure regulator **coupled to** said drilling fluid pressure sensor ... a relay **coupled to** said drilling fluid pressure regulator ... a drill string controller **coupled to** said relay”

Plaintiff	Defendant
Connected to.	A physical connection between a device and another device.

b. Court’s Construction

Defendant asserts claim 1 is directed to a “drilling system” comprising four distinct physical components that make up the system: a sensor, a regulator, a relay, and a drill string controller. According to Defendant, these physical components of the drilling system are “coupled to” each other as stated in claim 1, and various signals are passed between the “coupled” components of the drilling system. Defendant contends these signals must be passed over a physical connection between the components in order to pass from one component to another.

Plaintiff has proposed that if “coupled to” requires interpretation, it should be interpreted according to its plain and ordinary meaning of “connected to.” Plaintiff takes issue with Defendant’s requirement of a physical connection,” asserting Defendant acknowledges that “[t]he coupling or *connecting* occurs within the automatic driller. . . .” and that claim 1 “does not include any other *connective* device.” Defendant’s response at pg. 24.

The Colorado court interpreted “coupled to” consistent with Plaintiff’s proposed construction. *Pason* Jury Charge at pgs. 7-8. The Colorado court rejected the proposed limiting interpretation similarly offered by Defendant here:

[Defendant] accepts that the ‘relay’ coupled to the drilling fluid pressure regulator to supply a drill string control signal includes ‘a device that communicates an electric, mechanical or pneumatic signal’ as Varco contends but argues that **coupled to** requires that the relay device be attached at the output of the drilling fluid pressure regulator. **That is an undue restriction which would exclude coupling by tubes, lines or pipes that transmit hydraulic or pneumatic signal as described in the preferred embodiments. Coupled means connected.**

Pason Court’s Ruling on Claim Construction at pgs. 3-4 (emphasis added).

Claim 1 of the ‘142 Patent uses the term “coupled to” to describe how the various elements are interconnected so that signaling can be communicated between them. In the preferred embodiments of the ‘142 Patent, various components are “coupled” via tubes, lines, or pipes that transmit either hydraulic or pneumatic signals.

The specification of the ‘142 Patent describes the various components of an automatic driller being “coupled” as “attached” and “connected,” used interchangeably, as follows:

Each of the regulators *attaches* to a relay ... The relays *connect* in series ... The drill string controller *attaches* to the relays to receive a drill string control signal ... the relay *connected* to the drilling fluid pressure regulator.

‘142 patent, Col. 2, ll. 15-30. The specification further describes an embodiment that is electrically “coupled,” *e.g.*, that is connected or coupled through a suitable conductor such as a wire. ‘142 Patent, Col. 22, ll. 20 – 23 (“the electrical output of the transducer would be input into. . .”)

Defendant’s proposed construction excludes indirect connections via wires, hoses, lines, etc., and it excludes the preferred embodiments of the specification of the ‘142 Patent which disclose indirect connections between devices such as hoses, tubes, and wires. *See* ‘142 Patent, FIGS. 4 & 5. As shown in FIG. 4, drilling fluid pressure sensor 34 may comprise dual rubber boot sensor 100 ... Dual rubber boot sensor 100 connects to automatic driller 33 utilizing hydraulic line 111 and hydraulic line connector 112 which screws within blocks 101 and 104. ‘142 Patent, Col. 4, ll. 57 – 64. “[C]laim construction that does not encompass a disclosed embodiment is ... rarely, if ever, correct.” *Pfizer, Inc. v. Teva Pharm. USA, Inc.*, 429 F.3d 1364, 1373-74 (Fed. Cir. 2005).

The file histories, including both reexaminations, reveal how a person of ordinary skill in the art would interpret the “coupled to” language of claim 1 of the ‘142 Patent. In the original prosecution, the PTO rejected claim 1 in view of U.S. Patent No. 4,165,789 to Rogers because it disclosed a drilling fluid pressure regulator, *i.e.*, “computer control system for optimizing the penetration rate,” which is electrically “coupled to” sensors and a relay. Original File Wrapper (WS 127).

In the First Reexamination, the PTO granted the request for reexamination in view of U.S. Patent No. 3,223,183 because Varney provides a drilling fluid pressure regulator coupled to “sensor 112 measuring changes in drilling fluid pressure. . . .” ‘142 First Reexamination File Wrapper at pg. 39. The PTO examiner further stated that “Power transformer 132 drives a brake 134 that is considered the controller *coupled to* the relay.” *Id.* (emphasis added). As urged by Plaintiff, the PTO Examiner, presumed to be a person of ordinary skill in the art, understood “coupled to” may include indirect connections such as electric connections.

Plaintiff's construction of "coupled to" is consistent with the specification, the prosecution history, and the ordinary and customary meaning of the terms as they would be understood by a person of ordinary skill in the art. Accordingly, the Court construes the term "coupled to" to mean "connected to."

9. "Drill string control signal"

a. Parties' Positions

The parties propose the following constructions for "drill string control signal" which is present in claim 1 of the '142 Patent.

Claim 1: "a relay coupled to said drilling fluid pressure regulator, said relay responsive to the output signal of said drilling fluid pressure regulator to supply a **drill string control signal** at an output thereof; and a drill string controller coupled to said relay wherein a decrease in drilling fluid pressure results in said relay supplying a **drill string control signal** that operates said drill string controller to effect an increase in the rate of release of said drill string with direct effect at the drill bit associated with the drill string and an increase in drilling fluid pressure results in said relay supplying a drill string control signal that operates said drill string controller to effect a decrease in the rate of release of said drill string with direct effect at the drill bit associated with the drill string."

Plaintiff	Defendant
No construction necessary. Alternatively: A signal used to control the rate of release of the drill string.	A signal from a relay of a certain or sufficient power to operate the drill string controlled.

b. Court's Construction

Plaintiff contends this term should be given its commonly understood meaning, and no construction is necessary. Plaintiff asserts "drill string" is a commonly recognized term in the drilling

industry, which is consistent with its description in the specification: “drill string (21)” as the series of pipes interconnected with the mud motor (85) and drill bit (23) that is suspended from the rig and which transmits the rotational motion and drilling fluid from the drilling rig to the drill bit (23). Alternatively, if some construction is required, Plaintiff asserts the “drill string control signal” is the relative amount of compressed air delivered to an air motor. According to Plaintiff, the amount of compressed air controls the rotational speed of the air motor and thus the direction and degree the cable wheel (206) turns to lift and lower the drawwork’s brake handle (208) via a cable (207) connected between the wheel (206) and handle (208), increasing and decreasing the braking force applied to the drum and thereby increasing or decreasing the rate of release of the drill string.

According to Defendant’s proposed construction, the relay responds to a regulator signal to supply a drill string control signal, and changes in drilling fluid pressure result in the relay supplying a drill string control signal. As such, Defendant asserts the drill string control signal is “a signal from a relay.” Defendant’s proposed construction also requires that the “drill string control signal” must be of a “certain or sufficient power” to operate the drill string controller.

In support of its proposed construction, Defendant states the language of claim 1 requires a “drill string control signal that *operates* said drill string controller to effect [an increase or decrease] in the rate of release of said drill string.” According to Defendant, the explicit requirement that the drill string control signal “operates” the drill string controller means that the drill string control signal must power the drill string controller. Defendant relies on the embodiment of Figure 2, asserting the drill string control signal is a compressed air signal that drives air motor 204 in the drill string controller. According to Defendant, in all of the embodiments shown in the ‘142 Patent, the drill string control signal from the relay provides the power to operate or drive the drill string controller.

However, there is no mention in the claim language or in the specification relating to the power of the signal. Instead, the signal is repeatedly referred to in terms of its effect on the rate of release of the drill string:

[I]t supplies a drill string control signal that operates the drill string controller to effect an increase in the rate of release of the drill string. Conversely, an increase in drilling fluid pressure results in the relay supplying a drill string control signal that operates the drill string controller to effect a decrease in the rate of release of the drill string.

‘142 Patent, Col. 2, ll. 29 – 35.

There is also no support in the claim language that “operates” relates to power. In addition, as noted above in the Court’s construction of “operates,” Defendant’s proposed construction would exclude different embodiments described in the specification of the patent. This is another improper attempt to import restrictions that necessarily exclude the preferred embodiment.

Although the Court disagrees with Defendant’s proposed construction, the Court is of the opinion this phrase should be construed. The Court will adopt a modified construction of “a drill string control signal” to mean “a signal from a relay used to control the rate of release of the drill string.”

10. **“Relay responsive to the output signal of said drilling fluid pressure regulator”**

a. Parties’ Positions

The parties propose the following constructions for “relay responsive to the output signal of said drilling fluid pressure regulator” which is present in claim 1 of the ‘142 Patent.

Claim 1: “a relay coupled to said drilling fluid pressure regulator, said **relay responsive to the output signal of said drilling fluid pressure regulator** to supply a drill string control signal at an output thereof.”

Plaintiff	Defendant
No construction necessary, <i>e.g.</i> , a device that communicates, conveys, or imparts an electrical, mechanical, hydraulic, or pneumatic signal to, <i>e.g.</i> , control the movement (neutral, up or down) of the rig's hoisting system's brake handle.	A device that receives an input signal only from the drilling fluid pressure regulator and allows the flow of the output control signal.

b. Court's Construction

According to Plaintiff, Defendant's proposal is an attempt to import a limitation into the claim requiring the device to receive an input signal directly from the drilling fluid pressure regulator. Defendant asserts the relay in claim 1 must be coupled to the drilling fluid pressure regulator, must be responsive to the output of the drilling fluid pressure regulator, and must supply the drill string control signal that operates the drill string controller. According to Defendant, the claim language does not state that the relay is responsive generally to a signal from an unspecified source or that the relay is responsive to a signal from any other specified source. Defendant concludes that the device (relay) receives an input signal only from the drilling fluid pressure regulator.

However, as seen previously in the Court's construction of "coupled to," connections can be indirect through, for example, electrical communications via wires. In addition, the word "only" is not found in the claims or the specification. *See Liebel-Flarsheim Co.*, 358 F.3d at 905 (only import limits to claims when patentee has demonstrated "a clear intention to limit the claim scope using words or expressions of manifest exclusion or restriction"). Nowhere in the language of claim 1 is the limitation that the signal must come "only" or "directly" from the drilling fluid pressure regulator.

The Court does not find helpful or clarifying the alternative proposed construction offered by Plaintiff. The Court agrees with Defendant that Plaintiff’s alternative construction includes the type of signal relayed, as electrical, mechanical, hydraulic or pneumatic, and is an improper attempt to broaden the claim. Claim 1 is silent on the type of signal relayed. Instead, the Court is of the opinion this phrase consists of commonly used words that can be given their ordinary and customary meaning. Therefore, the Court finds no construction is necessary for “relay responsive to the output signal of said drilling fluid pressure regulator.”

11. “Drill string controller”

a. Parties’ Positions

The parties propose the following constructions for “drill string controller” which is present in claims 1, 11, and 14 of the ‘142 Patent.

Claim 1: “a **drill string controller** coupled to said relay wherein ... relay supplying a drill string control signal that operates said **drill string controller** to effect an increase in the rate of release ... relay supplying a drill string control signal that operates said **drill string controller** to effect a decrease in the rate of release ...”

Claim 11: “relaying said signal to a **drill string controller**; and controlling said **drill string controller** to increase the rate of release of said drill string with direct effect at the drill bit associated with the drill string when said signal represents ...”

Claim 14: “relaying said selected signal or signals to a **drill string controller** which regulates the release said drill string in response to said selected signal or signals.”

Plaintiff	Defendant
No construction necessary. Alternatively: A device that controls the rate of release of the drill string.	The entire mechanism or all of the devices that are required to receive a drill string control signal, connected to the drill string and increase and decrease the rate of release of the drill string.

b. Court's Construction

Plaintiff contends the phrase “drill string controller” consists of commonly used words that can be given their ordinary and customary meaning. According to Plaintiff, the inventor did not use a special meaning for the phrase “drill string controller” other than a device which manipulates a friction brake system to control the rate of release of the drill string. Plaintiff asserts the terms contained in the phrase are continuously used in the specification without further definition. *See, e.g.*, ‘142 Patent, Col. 2, ll. 15-17; Col. 2, ll. 30-31; Col. 2, ll. 48-50. If the Court feels the phrase requires construction, Plaintiff proposes the following alternative proposal: “A device that controls the rate of release of the drill string.”

According to Defendant, Plaintiff's alternative proposal requires minimal equipment (*i.e.* only a friction brake system) that neither directly receives the drill string control signal, nor directly increases or decreases the rate of release of the drill string. Defendant asserts such a construction is contrary to the plain language of the claims and highlights the dispute between the parties, demonstrating the need for construction of this term.

The Court basically agrees with Plaintiff's alternative proposal. However, given the Court's construction of “drill string control signal” as “a signal from a relay used to control the rate of release of the drill string,” rather than utilize Plaintiff's alternative construction verbatim, the Court construes “drill string controller” to mean “the mechanism or device that controls the rate of release of the drill string.”

V.

Conclusion

The Court hereby orders the claim terms addressed herein construed as indicated. A chart summarizing these constructions is attached as Exhibit A.

The parties are further ordered that they may not refer, directly or indirectly, to each other's claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual constructions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the constructions adopted by the Court.

SIGNED this 16th day of August, 2011.


CAROLINE M. CRAVEN
UNITED STATES MAGISTRATE JUDGE

EXHIBIT A

Claim Term	Plaintiff's Proposed Construction	Defendant's Proposed Construction	Court's Construction
1. Results '142 Patent Claim 1.	Needs no construction.	The drill string controller increases the rate of release with any decrease in drilling fluid pressure and decreases the rate of release with any increase in drilling fluid pressure.	No construction necessary.
2. To Control '142 Patent Claim 14.	Needs no construction.	The drill string controller increases the rate of release with any decrease in drilling fluid pressure and decreases the rate of release with any increase in drilling fluid pressure.	No construction necessary.
3. Controlling '142 Patent Claim 11.	Needs no construction.	The drill string controller increases the rate of release with any decrease in drilling fluid pressure and decreases the rate of release with any increase in drilling fluid pressure.	No construction necessary.
4. Operates '142 Patent Claim 1.	Needs no construction.	The drill string controller increases the rate of release with any decrease in drilling fluid pressure and decreases the rate of release with any increase in drilling fluid pressure	No construction necessary.
5. Controlling said drill string controller to increase the rate of release of said drill string when said signal	Needs no construction.	The drill string controller increases the rate of release with any decrease in drilling fluid pressure and decreases the rate of release with any increase in drilling fluid pressure.	No construction necessary.

<p>represents a decrease in drilling fluid pressure and to decrease the rate of release of said drill string when said signal represents an increase in drilling fluid pressure</p> <p>‘142 Patent Claim 11</p>			
<p>6. Rate of release</p> <p>‘142 Patent Claims 1 and 11</p>	Rate of lowering.	Rate of lowering.	Rate of lowering.
<p>7. With direct effect at the drill bit associated with the drill string</p> <p>‘142 Patent Claims 1 and 11.</p>	Needs no construction.	The vertical movement of the drill string at the drill bit actuated by pressure of the pumped fluid. In addition, this term requires that the effective weight of the entire drill string must be applied to the drill bit.	No construction necessary.
<p>8. Producing a signal in response to changes in drilling fluid pressure, said signal representing the changes in</p>	<p>Needs no construction.</p> <p>Alternatively: e.g. to create, generate, produce a signal in reaction to something said signal representing</p>	A signal generated by, and representing, only increases and decreases in drilling fluid pressure.	No construction necessary.

drilling fluid pressure '142 Patent Claim 11.	changes in drilling fluid pressure.		
9. “measuring changes” and “changes” '142 Patent Claim 1, 11 and 14.	Measurement of changes over time which will also be compared to a set reference point.	Any increase or any decrease.	An increase or a decrease from a set reference point or from a previously measured value.
10. Selecting '142 Patent Claim 14.	Needs no construction. Alternatively: e.g., automatic selecting, i.e., choosing	Choosing of only the first signal to control the release of the drill string or only the second signal to control the release of the drill string or both the first and the second signal to control the release of the drill string.	Automatically choosing.
11. Relay or Relaying or Relaying said selected signal or signals '142 Patent Claims 1, 11 and 14.	Relay = A device that communicates an electronic, mechanical or pneumatic signal. Relaying = Conveying or passing along said selected signal.	The act of receiving an input signal only from the drilling fluid pressure regulator and allowing the output signal to flow.	Relay = no construction necessary. Relaying/relaying said selected signal or signals = passing along the selected signal or signals to a drill string controller which regulates the release of the drill string in response to the selected signal or signals.
12. Drilling fluid pressure regulator '142 Patent Claim 1.	Needs no Construction. Alternatively: A drilling fluid (i.e, mud) pressure regulator, e.g., a device that is capable of detecting and responding to	A device that is calibrated and receives an input signal only from the drilling fluid pressure sensor and measures changes in drilling fluid pressure over time which will be the difference between a predetermined value and a current measured value and outputs a signal	No construction necessary.

	electrical, mechanical, hydraulic, or pneumatic signal(s).	corresponding to drilling fluid pressure changes to a relay.	
13. Coupled to '142 Patent Claim 1.	Connected to.	A physical connection between a device and another device.	Connected to.
14. Drill string control signal '142 Patent Claim 1.	Needs no construction. Alternatively: A signal used to control the rate of release of the drill string.	A signal of sufficient power to operate the drill string controller.	A signal from a relay used to control the rate of release of the drill string.
15. Relay responsive to the output signal of said drilling fluid pressure regulator '142 Patent Claim 1.	Needs no construction. Alternatively: A device that communicates, conveys, or imparts an electrical, mechanical, hydraulic, or pneumatic signal to, <i>e.g.</i> , control the movement (neutral, up or down) of the rig's hoisting system's brake handle.	A device that receives an input signal only from the drilling fluid pressure regulator and allows the flow of the output control signal.	No construction necessary.
16. Drill string controller '142 Patent Claims 1, 11 and 14.	Needs no construction. Alternatively: A device that controls the rate of release of the drill string.	The entire mechanism or all of the devices that are required to receive a drill string control signal, connected to the drill string and increase and decrease the rate of release of the drill string.	The mechanism or device that controls the rate of release of the drill string

17. Drill bit '142 Patent Claims 1 and 11.	Needs no construction.	Needs no construction.	No construction necessary.
18. “Producing a first signal in Response to Changes” and “Producing a second signal in response to changes” '142 Patent Claim 14	Needs no construction.	Needs no construction.	No construction necessary.
19. Regulates the release '142 Patent Claim 14.	To increase or decrease the rate of lowering of the drill string.	To increase or decrease the rate of lowering of the drill string.	To increase or decrease the rate of lowering of the drill string.